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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,582	01/18/2005	Shiquan Wu	213222.00098	4027

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PATENT ADMINISTRATOR
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/521,582	WU ET AL.
	Examiner	Art Unit	
	Hirdepal Singh	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>18 January 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-29 and 44-52</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-29 and 44-52</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>18 January 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some *   c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the filing date of January 18, 2005. claims 1-29 and

44-52 are pending and have been considered below.

Specification

2.   The disclosure is objected to because of the following informalities: Under the

heading "Brief description of the drawings" there is no description about figure 12, which

is part of the original disclosure.

Appropriate correction is required.

Claim Objections

3.   Claims 1-4, 9-10 and 15-16 are objected to because of the following informalities:

In line 6, claim 1 recites "...the synthetic block having a prefix, a payload..." seems like

a typographical error. Similarly, in claim 9 line 2; claim 15 line 2; claim 17 line 4; and

claim 21 lines 2 and 9 have the same typo errors. Examiner believes it should be

"synthesized block" in place of "synthetic block".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Baum et

al. (US 2002/0126741).

Regarding claims 1 and 5:

As shown in figures 2-4 and figure 8, Baum et al discloses a method of

equalizing a received scrambled block that was transmitted through a channel

(paragraph 0020), the scrambled block having a prefix, a payload, and a suffix/postfix

(paragraphs 0020-0021 and 0024-0026), the method comprising the steps of:

determining a synthesized portion of a synthesized block that would have been

received if the suffix of the scrambled block had been identical to the prefix (paragraphs

0020, 0026-0028) when the scrambled block was transmitted, the synthesized block

having a prefix, a payload/data, and a suffix corresponding to the prefix, the payload,

and the suffix of the received scrambled block, and the synthesized portion selected

from the group consisting of the prefix, the payload, and the suffix of the synthesized block (paragraphs 0024-0026);

forming the synthesized block (figure 8; paragraphs 0034-0036) from the synthesized portion and a portion of the received scrambled block by appending the payload and suffix of the received scrambled block to the synthesized portion to form the synthesized block if the selected synthesized portion is the prefix of the synthesized block (paragraphs 0024-0028), the suffix of the received scrambled block to the synthesized portion to form the Synthesized block if the selected synthesized portion is the payload of the synthesized block, and the synthesized portion to the payload of the received scrambled block to form the synthesized block (paragraphs 0035 and 0088) if the selected synthesized portion is the suffix of the synthesized block;

determining a discrete Fourier transform (325 in figures 3 and 4; figure 9) of the synthesized block to obtain a determined discrete Fourier transform;

performing a frequency domain equalization (330 in figures 3 and 4) on the determined discrete Fourier transform; and

determining an inverse discrete Fourier transform (335 in figures 3 and 4) of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted.

Regarding claims 2 and 6:

Baum et al discloses all of the subject matter as described above and further

discloses that the prefix and the suffix of the transmitted scrambled block are known

(figure 6; paragraphs 0028, 0071 and 0088).

Regarding claims 3 and 7:

Baum et al discloses all of the subject matter as described above and further

discloses that the channel has a known channel response length and the prefix and

suffix of the transmitted scrambled block have lengths at least equal (paragraph 0033)

to the channel response length.

Regarding claims 4 and 8:

Baum et al discloses all of the subject matter as described above and further

discloses that the prefix and suffix of the transmitted scrambled block each have the

same length, which is equal to the channel response length (paragraphs 0033 and

0081).

Regarding claim 9:

Baum et al discloses all of the subject matter as described above and further

discloses that the scrambled block is represented by a sequence of data symbols and

the prefix of the synthetic block is determined by sending a sequence of data symbols

that represents the suffix (paragraph 0034) of the transmitted scrambled block followed

by a sequence of data symbols that represents the prefix (paragraph 0035) of the

transmitted scrambled block through a model of the channel and retaining the portion of

the resulting sequence corresponding to the sequence of data symbols that represents

the prefix as the prefix of the synthetic block (paragraph 0093).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et

al. (US 2002/0126741) in view of Dobson et al. (US 6,603,811).

Regarding claim 10:

Baum et al discloses all of the subject matter as described above except for

specifically teaching that the channel is modeled by an FIR filter.

However, Dobson et al in the same field of endeavor discloses a system and

method for low complexity frequency domain equalizer where the communication

channel is modeled by an FIR filter (abstract; column 2, lines 35-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of invention to model the channel as an FIR filter in order to get the characteristics

of the FIR filter that distorts the transmitted signal and the distortion is removed by de-convolution of channel response via frequency domain multiplication.

8.   Claims 11-15, 17-21, 23-29 and 44-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al. (US 2002/0126741) in view of Moon et al. (US 2006/0050776).

Regarding claims 11 and 17:

Baum et al discloses a method of equalizing a received scrambled block that was transmitted through a channel (paragraph 0020), the scrambled block having a prefix, a payload, and a suffix (paragraphs 0020-0021 and 0024-0026), the method comprising the steps of:

determining a synthesized payload of a synthesized block that would have been received if the suffix of the scrambled block had been identical to the prefix when the scrambled block was transmitted (paragraphs 0020, 0026-0028);

determining a discrete Fourier transform (325 in figures 3 and 4; figure 9) of the synthesized block to obtain a determined discrete Fourier transform;

performing a frequency domain equalization (330 in figures 3 and 4) on the determined discrete Fourier transform; and

determining an inverse discrete Fourier transform (335 in figures 3 and 4) of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted.

Baum et al discloses all of the subject matter as described above and further

discloses forming the synthesized block from the synthesized payload and the received

scrambled block by replacing the payload of the received scrambled block (paragraphs

0043 and 0046-0047) with the synthesized payload, except for specifically teaching that

removing the prefix of the received scrambled block.

However, Moon et al in the same field of endeavor discloses a system and

method for optimally estimating cyclic prefixes where the scrambled signal is sent over

the communication channel and further shows removing the prefix of the received

scrambled block (figure 1; paragraph 0013).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of invention to remove the prefix of the received scrambled signal in order to get

the clean transmission signal as the prefix were added in the scrambled signal to

prevent the influence of inter-symbol interference in the communication channel are no

longer required in the received signal.

Regarding claims 12 and 18:

Baum et al discloses all of the subject matter as described above and further

discloses that the prefix and the suffix of the transmitted scrambled block are known

(figure 6; paragraphs 0028, 0071 and 0088).

Regarding claims 13 and 19:

Baum et al discloses all of the subject matter as described above and further

discloses that the channel has a known channel response length and the prefix and

suffix of the transmitted scrambled block have lengths at least equal (paragraph 0033)

to the channel response length.

Regarding claims 14 and 20:

Baum et al discloses all of the subject matter as described above and further

discloses that the prefix and suffix of the transmitted scrambled block each have the

same length, which is equal to the channel response length (paragraphs 0033 and

0081).

Regarding claims 15 and 21:

Baum et al discloses all of the subject matter as described above and further

discloses that the scrambled block is represented by a sequence of data symbols and

the prefix of the synthetic block is determined by sending a sequence of data symbols

that represents the suffix (paragraph 0034) of the transmitted scrambled block followed

by a sequence of data symbols that represents the prefix (paragraph 0035) of the

transmitted scrambled block through a model of the channel and retaining the portion of

the resulting sequence corresponding to the sequence of data symbols that represents

the prefix as the prefix of the synthetic block (paragraph 0093).

Regarding claims 23-26:

Baum et al discloses a method of transmitting a payload through a channel to a receiver, comprising the steps of:

forming a block in which the payload is preceded in the block by a prefix and followed in the block by a suffix (paragraph 0020);

transmitting the scrambled block through the channel to the receiver to obtain a received scrambled block (paragraphs 0020-0021 and 0024-0026); and

at the receiver, equalizing (330 in figures 3 and 4) the received scrambled block by determining a portion of a synthetic block that would have been received if the suffix of the scrambled block had been identical to the prefix (paragraphs 0020, 0026-0028) when the scrambled block was transmitted, the synthetic block having a prefix, a payload, and a suffix corresponding the prefix, the payload, and the suffix of the received scrambled block, and the synthesized portion selected from the group consisting of the prefix, the payload, and the suffix of the synthetic block, forming an intermediate block from the synthesized portion and a portion of the received scrambled block by appending the payload and suffix of the received scrambled block to the synthesized portion to form the intermediate block (figure 8; paragraphs 0034-0036 and 0088) if the synthesized portion is the prefix (paragraphs 0024-0028), the suffix of the received scrambled block to the synthesized portion to form the intermediate block if the synthesized portion is the payload, and the synthesized portion to the payload of the received scrambled block to form the intermediate block if the synthesized portion is the suffix; and

determining a discrete Fourier transform (325 in figures 3 and 4; figure 9) of the synthesized block to obtain a determined discrete Fourier transform; performing a frequency domain equalization (330 in figures 3 and 4) on the determined discrete Fourier transform; and determining an inverse discrete Fourier transform (335 in figures 3 and 4) of the result of the frequency domain equalization to obtain an estimate of the scrambled payload that was transmitted.

Baum et al discloses all of the subject matter as described above except for specifically teaching that scrambling the block prior to transmission; and unscrambling the estimate of the scrambled payload to recover the transmitted data payload.

However, Moon et al in the same field of endeavor discloses a system and method for optimally estimating cyclic prefixes where the scrambled signal is sent over the communication channel and further discloses scrambling the block prior to transmission (110 in figure 1); and unscrambling the estimate of the scrambled payload to recover the transmitted data payload (260 in figure 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to scrambling the block prior to transmission and unscrambling the estimate of the scrambled payload to recover the transmitted data payload in order to take advantage of the scrambling as is facilitates complete transmission of data without errors.

Regarding claims 27, 44, 47 and 50:

Baum et al discloses all of the subject matter as described above and further

discloses that the prefix and the suffix of the transmitted scrambled block are known

(figure 6; paragraphs 0028, 0071 and 0088).

Regarding claims 28, 45, 48 and 51:

Baum et al discloses all of the subject matter as described above and further

discloses that the channel has a known channel response length and the prefix and

suffix of the transmitted scrambled block have lengths at least equal (paragraph 0033)

to the channel response length.

Regarding claims 29, 46, 49 and 52:

Baum et al discloses all of the subject matter as described above and further

discloses that the prefix and suffix of the transmitted scrambled block each have the

same length, which is equal to the channel response length (paragraphs 0033 and

0081).

9.   Claims 16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Baum et al. (US 2002/0126741) in view of Moon et al. (US 2006/0050776), as

applied to claims 15 and 21 above, further in view of Dobson et al. (US 6,603,811).

Regarding claims 16 and 22:

Baum et al discloses all of the subject matter as described above except for specifically teaching that the channel is modeled by an FIR filter.

However, Dobson et al in the same field of endeavor discloses a system and method for low complexity frequency domain equalizer where the communication channel is modeled by an FIR filter (abstract; column 2, lines 35-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to model the channel as an FIR filter in order to get the characteristics of the FIR filter that distorts the transmitted signal and the distortion is removed by de-convolution of channel response via frequency domain multiplication.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hirdepal Singh whose telephone number is 571-270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off)8:00AM-5:00PMEST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HS
November 7, 2007

SHUWANG LIU
PATENT EXAMINER